

November 27,2002

Alice Lind  
Washington Dept. of Socia & Health Services  
Medical Assistance Administration  
P.O. Box 45530  
Olympia, WA 98504-5530

Re: Cost Effectiveness of Disease Management Programs

Dear Alice,

At your request, we have analyzed the cost effectiveness of the State of Washington purchasing disease management services for a subset of the Medicaid population. Based on the assumptions and methodology described below, we believe significant savings are achievable.

Type of Service	Disease Management Monthly Premium	Estimated Net Savings In Excess of DM Premiums	Return on Investment
24hr. Nurse Line <sup>1</sup>	\$0.79	\$1.10	2.40:1.00
Asthma	\$1.71	\$1.15	1.67:1.00
CHF	\$1.02	\$4.91	5.81:1.00
Diabetes	\$2.39	\$3.19	2.34:1.00
ESRD <sup>2</sup>	\$300.00	\$164.68	1.55:1.00
CKD <sup>2</sup>	\$50.00	\$11.29	1.23:1.00

<sup>1</sup> Savings estimated for DM eligible members, not enrolled in aDM program.

<sup>2</sup> Disease management premium paid per case per month, not PMPM.

*This analysis is intended for the use of the Washington State Department of Social and Health Services, Medical Assistance Administration as documentation of the cost effectiveness of disease management for CMS. It should not be relied upon by any other party or for any other purpose without written permission from Milliman USA.*

**24-Hour Nurse Line**

The population to whom the nurse line would be made available has characteristics not generally comparable to the literature we reviewed. Because of this, care and conservatism was used in

applying the results achieved for other populations. Note that in this section we looked at the nurse line only for those members who, although eligible for disease management services, are not enrolled in one of the disease management programs. Members who are enrolled in a disease management program were analyzed with the program they belong to. Some characteristics of the population studied are as follows:

- Emergency Room Costs – The table below illustrates the high frequency of visits to the emergency room for this population. Data below are for the time period 7/2000 – 6/2001, including six months of run out. It should also be noted that if the visit ultimately resulted in an inpatient admission, it was excluded. In comparison, we would expect half the number of cases from a loosely managed commercial population.

	Total Cases/Visits	Total Paid	Member Months	Annual Util/1000	Cost/ Service	Paid PMPM
<b><i>Emergency Room Use Statistics</i></b>						
Emergency Hospital Cases	108,886	\$47,609,365	1,873,347	697.5	\$437.24	\$25.41

- Limitations on Management – From the literature we reviewed, we found that many plans included incentives for the member to call the nurse line prior to visiting the emergency room. For example, one plan guaranteed acceptance of the claim if the member had called the line prior to visiting the ER; failure to do so could result in denial of the claim. Other plans made it mandatory, unless there was a life-threatening situation, that the member calls the line. Another incentive was a copay if the member failed to call the line first. To maximize the success of the 24-hour nurse line, we believe that DSHS should include some incentive for the user to call. However, in our savings analysis, we have assumed no such incentive exists.

In performing our analysis we made the following assumptions:

- We found data indicating that in a similar study, 35% of the callers intended to go to the ER. Although we feel this percentage could be higher due to the tendency this population has to go to the ER, we assumed 35% of callers intend to go to the ER as a conservative estimate.
- One of the sources we reviewed indicated that of the callers intending to go to the ER, after consultation with the nurse only one-third ultimately went to the ER. Although this seems realistic, given the overuse of the ER by this population, we estimated a more conservative proportion of callers who went to the ER. We have assumed that half of the callers who intended to go to the ER would go to the ER after their nurse call.
- We assumed that eliminated ER cases would have been less costly than remaining cases. This assumption is based on Milliman research using commercial data, which indicates

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that when unnecessary cases are removed, remaining cases are more intensive and more expensive.

- We have assumed a call rate of approximately 0.4045 per member annually. Note that for the time period we analyzed, we have calculated the average monthly membership of this population to be 156,112. This translates to about 5,262 monthly calls
- We have assumed that the primary source of savings from implementing the nurse line is the reduction of ER visits. While some potential ER visits will be entirely eliminated, many of the potential ER visits that are redirected by the nurse line will end up in a physician’s office. While savings are achieved, the entire cost of the ER visits is not saved in this case. Savings are equal to the difference in the cost of the ER visit and the office visit. The nurse line will also eliminate some office visits, shifting them to self care. This will save office visit costs as well as other costs that tend to follow office visits, such as prescription drugs. In the end, we have conservatively assumed that costs associated with shifting visits to the office and costs associated with eliminating office visits will have a net impact of \$0.00.

Because we are making estimates based on how this population will behave without any data from a similar population, the range of expected results could vary.

Our assumption is that a conservative estimate of reduced ER cases is 10.2%. Based on the literature we read, we saw ER cases reduced in the range of 6.1% to 15.2%. Our 10.2% estimate assumes nearly 5,300 monthly nurse line calls.

Monthly Nurse line Calls	Reduction Percentage	Reduced Annual Util/1000	Cost/ Service	Savings PMPM	Nurse Line PMPM	Savings PMPM	Return on Investment
5,262.8	10.2%	71.1	\$319.45	\$1.89	\$0.79	\$1.10	2.40:1.00

**Disease Management Programs**

It should be noted at the outset that while we project that significant savings are achievable for this population, in the event that no savings is achieved, our understanding is that DSHS will be reimbursed DM premiums. No savings and no loss would be a worst-case scenario; in the tables included in this letter, we have included what we believe is a conservative estimate of expected outcomes and savings.

As stated above, much of the literature reviewed was not entirely applicable to a Medicaid FFS population. Also, it should be noted that hospitalization rates for the state of Washington are lower than much of the nation. Therefore, it will be more difficult to reduce these utilization rates. There is also no assigned PCP for this population, so it is likely that the achievable reductions in ER usage will be lower as well. Because of this, as stated above, care and conservatism were used in applying results achieved for other populations. We have included a summary of disease management studies that went into forming our assumptions (Attachment I).

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You will find that we have generally assumed less aggressive results than found in the literature, again with the desire that our conclusions are achievable.

For each of the disease programs, we have generated experience cost models for members currently enrolled in those programs. For those individuals, we have summarized their claims experience for the time period July 2000 – June 2001 with a six month run out. For this analysis, we have assumed the data to be complete. We have not trended the claims costs as an additional element of conservatism in the estimated savings.

Data has been generally summarized by DSHS categories of service. We have split inpatient services into multiple lines of services based on APDRG codes.

The exact number of members in each of these disease programs fluctuate over time. For this analysis, we have summarized claims data for those members who, based on claims and eligibility data, would be eligible for these programs as of January 2002. The exception to this was ESRD and CKD. Both of these programs require an individual review of each case in order to be enrolled. For ESRD, we received a list of those currently enrolled in the program and pulled their claims for the time period described above. It is our understanding that CKD currently does not have any patients taking part in that program. Based on procedure codes, diagnosis codes, provider types and overall claim levels, we created a dataset that reflects claims of future CKD members for both costs and distribution of services in terms of total and service line detail.

Tables are as follows:

- Table 1 Cost Effectiveness of Asthma Disease Management Program
- Table 2 Cost Effectiveness of CHF Disease Management Program
- Table 3 Cost Effectiveness of Diabetes Disease Management Program
- Table 4 Cost Effectiveness of ESRD Disease Management Program
- Table 5 Cost Effectiveness of CKD Disease Management Program

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<i>Type of Service</i>	<i>Monthly Claims Cost per DM Patient</i>	<i>Monthly Savings per DM Patient</i>	<i>Monthly Savings per DM Eligible Member</i>	<i>Disease Management Monthly Premium</i>	<i>Estimated Net Savings In Excess of DM Premiums</i>	<i>Return on Investment</i>
<i>Asthma</i>	\$559.26	\$67.98	\$2.86	\$1.71	\$1.15	1.67: 1.00
<i>CHF</i>	\$1,605.15	\$357.80	\$5.93	\$1.02	\$4.91	5.81:1.00
<i>Diabetes</i>	\$871.88	\$103.54	\$5.58	\$2.39	\$3.19	2.34: 1.00
<i>ESRD<sup>1</sup></i>	\$6,385.32	\$464.68	na	\$300.00	\$164.68	1.55:1.00
<i>CKD<sup>1</sup></i>	\$708.43	\$61.29	na	\$50.00	\$1 1.29	1.23:1.00

<sup>1</sup> Disease management premium paid per case per month, not PMPM.

Based on our analysis, savings should be realized for the programs the state is currently contracted for.

Actual results will vary depending on prevalence of diseases, provider practice patterns, cost trends and particularly how well disease management is implemented. Our estimates are based on actuarial and medical judgment as well as literature searches. We have not looked at specific outcomes from the vendors currently being contracted by the state.

In performing this analysis, we have relied on data provided to us by the State of Washington. We have not audited or verified this data and other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete.

We have performed a limited review of the data used directly in our analysis for reasonableness and consistency, and have not found material defects in the data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

Should you or others at DSHS have questions regarding the information presented in this letter or its intended application, please do not hesitate to contact me at (206) 504-5603.

Sincerely,

Timothy S. Barclay, FSA, MAAA  
Consulting Actuary

/kcp

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Attachments